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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/840,924	04/25/2001	David A. Jackson	10473-670	6504

7590

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EXAMINER

NGUYEN, THU V

ART UNIT

PAPER NUMBER

3661

DATE MAILED: 07/30/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/840,924

Applicant(s)

JACKSON ET AL.

Examiner

Thu V Nguyen

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11, 14, 17-25, 27 and 30 is/are rejected.
- 7) ☒ Claim(s) 10, 12, 13, 15, 16, 26, 28, 29, 31 and 32 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Information Disclosure Statement

1. The listing of references in the specification page 2, line 2, and page 6, line 13 is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Specification

2. The disclosure is objected to because of the following informalities:
 - a. In the specification page 6, line 10, and lines 11-12, the disclosed "118, 120, *120*, 124" should be corrected to "118, 120, 122, 124".
 - b. In the specification page 6, line 15, the disclosed "target elements *112*" should be corrected to "target elements 136" to correspond with the number index in fig.1.
 - c. In the specification page 6, line 19, the "rack 133" should be corrected to "rack 140".
 - d. In the specification page 9, line 8 and 10, the "the rear wheels 128, 130" should be corrected to the "the rear wheel 128, and the front wheel 130".

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Claim Objections

3. Claims 5, 9, 12, 15, 21, 25, 28, and 31 are objected to because of the following informalities:
- a. In claim 5, lines 3-5, the claimed “perpendicularly from the wheel track passing through the one of the right wheels *to the wheel track passing* through the other of the right wheels” should be corrected to “perpendicularly from the wheel track passing through the one of the right wheels through the other of the right wheels”, since as disclosed in fig. 2, the wheel base is perpendicular to the one wheel track passing through the right and left front wheels.
 - b. Similarly, claim 5, lines 7-8 should be corrected to “perpendicularly from the wheel track passing through the one of the left wheels through the other of the left wheels”.
 - c. Similarly, claims 21, lines 3-5, and lines 6-7, should be corrected as discussed in claim 5, lines 3-5, and 7-8 above.
 - d. In claim 9, line 7; claim 25, line 7, the claimed “the front and wheel tracks” should be corrected to “the front and rear wheel tracks”.
 - e. In claim 12, line 4; claim 15, line 4; claim 28, line 4; claim 31, line 4, the claimed “for difference” should be corrected to “for the difference”.

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Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-9, 11, 14, 17-25, 27, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over January (U.S. Patent No. 5,675,515) (enclosed IDS).

As per claim 1, January discloses a method of determining alignment between the wheels. The method comprises the steps of: indicating wheel positions on the vehicle with targets (col.10, lines 3-17); calculating the relationship between the front and rear wheels (col.16, lines 36-38).

January does not explicitly teach imaging the targets to obtain locations of the wheel positions. However, January teaches using cameras 50-51 (fig.4) with targets 63-66 (fig.4) to determine the position of the wheels (col.9, lines 47-67; col.10, lines 3-18), further, using the cameras for taking image of the positions of the targets would have been well known. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the cameras 50-51 (fig.4) of January to take the image of the targets 63-66 (fig.4) in order to facilitate analyzing the position of the wheel from the pictures taking obtained from the cameras.

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As per claim 2, January teaches calculating front and rear wheel track (col.16, lines 53-59).

As per claim 3, January teaches calculating the relationship between the calculated front wheel track and rear wheel track by comparing the angle between the front and the rear wheel track (col.16, lines 40-42). January does not explicitly teach comparing the angle to a specified range for the angle. However, assigning a specified tolerable range for the angle between the front and rear wheel would have been well known. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to compare the angle between the front and rear wheels with a predetermined angle range in order to facilitate judgement of the alignment of the front and rear wheel without requiring the operator to perform manual comparison himself.

As per claim 4, January does not explicitly teach determining the relationship between the front and rear wheel by comparing the front and the rear wheel track to a specified range for the front and rear tracks. However, January teaches determining angles of the front wheel track and rear wheel track (col.16, lines 25-30) and calculating the relationship between the front and rear wheel tracks by observing the angles (col.16, lines 30-35). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to compare the angles of January with a predetermine specified range in order to facilitate recognizing if it is the front or the rear wheel that needs aligning.

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As per claim 5, 7, January teaches calculating the right and left wheel base 111-112, and 94-95 (fig.10) (col.16, lines 47-61).

As per claim 6, 8, January does not explicitly disclose comparing the right/left wheel base to specified ranges. However, January teaches defining the right/left wheel base as in the conventional alignment system (col.16, lines 47-61), further, using the wheel bases to determine alignment of the right/left wheels would have been conventional (January col.16, lines 56-61). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to compare each right/left wheel base to a specified tolerable range in order to determine alignment status of the right and left wheels.

As per claim 9, January does not teach establishing a line passing through a center point and perpendicular to the wheel track, and determining the offset between the intersection point of the line with the other wheel track and the center point of the other wheel track. However, January teaches calculating a front/rear center points of the front/rear wheel track and defining a line 96 (fig.10) from the center points (fig.10), and further teaches drawing a line perpendicular with another line through a point (col.16, lines 25-27). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to draw a line passing through the center point and perpendicular to a track line of January and to determine the offset of the line to the center of the other wheel track when desired, since drawing a line from a defined point and

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line, and comparing the intersection coordinate of the line to another defined line with a point of known coordinate requires only routine skill in the art.

As per claim 11, 14, January does not teach calculating the first and second diagonals, and calculating skew angles between the diagonals and the wheel tracks as claimed. However, January teaches locating the coordinates 84-87 (fig.10) of the wheels (col.15, lines 25-27). Further, drawing and calculating diagonals, and the skew angle between the diagonals with other lines joining the four known points in a plane would have well known. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to draw and to calculate the first and second diagonals, and the skew angle between the diagonal and a line joining the two known positions of the wheels of January, since drawing diagonal lines between four known points, and calculating the skew angle between the diagonal and a line joining the two wheel locations of January when needed requires only routine skill in the art.

As per claim 17-25, 27, and 30, refer to discussion in claims 1-9, 11, and 14 above.

Allowable Subject Matter

6. Claims 10, 12, 15, 26, 28, and 31 would be allowable if rewritten to overcome the claim objection set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

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7. Claims 13, 16, 29 and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

Prior art of record does not disclose a method and system for determining alignment between the wheels of a vehicle in which the positions of the wheels are determined by imaging the targets indicating the position of the wheels; the front and rear wheel track, the front and rear center point of the front and rear wheel track are determined, the interception point of a line from a one center point of the wheel track and perpendicular to the wheel track with the other wheel track is determined and the offset between the interception point and the center point of the intercepted wheel track is calculated, and the relationship between the front and rear wheel is determined by comparing the offset to a specified range for the offset distance as taught in the combination of claim 1-2, and 9-10. Prior art of record, further, does not disclose calculating the first diagonal between the right front wheel and the left rear wheel, and the second diagonal between the left front wheel and the right rear wheel, the relationship between the front and rear wheel can be determined by comparing the difference between the first and the second diagonals to a specified range for the difference as taught in the combination of claims 1, 11, and 12 ; or can be determined by comparing the first diagonal to a specified range for the first diagonal, and comparing the second diagonal to a specified range for the second diagonal as taught in the

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combination of claims 1, 11, and 13. Prior art of record, further, does not disclose calculating the first and second skew angles, and determining the relationship between the front and rear wheels by comparing the difference between the first and second skew angle to a specified range for the difference as taught in the combination of claims 1, 11, 14-15; or determining the relationship between the front and rear wheels by comparing the first skew angle to a specified range for the first skew angle, and comparing the second skew angle to a specified range for the second skew angle as taught in the combination of claims 1, 11, 14, and 16. The claims 26, 28-29, 31-32 are the claimed system that is implemented to perform the method of claims 10, 12-13, and 15-16.

Cited Prior Arts

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
 - a. January et al (U.S Patent No. 6,064,750) teaches determining wheel alignment by measuring the positions and orientations of the wheels in a three dimensional coordinate system.
 - b. Jackson (U.S Patent No. 5,943,783) teaches determining the alignment of wheels utilizing targets and cameras (fig.9).

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

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Washington, D.C. 20231

or faxed to:

(703) 305-7687, (for formal communications intended for entry)

Or:

(703) 305-7687 (for informal or draft communications, please label
"PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park V, 2451 Crystal Drive, Arlington, VA.,
Seventh Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thu Nguyen whose telephone number is (703) 306-9130. The examiner can normally be reached on Monday-Thursday from 8:00 am to 6:00 pm ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Cuchlinski, can be reached on (703) 308-3873. The fax phone number for this Group is (703)305-7687 .

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703)308-1111.



Thu Nguyen

July 23, 2002